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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/620,388	07/17/2003	Hajime Ikuno	240441US0	9623

22850 7590 08/09/2005

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EXAMINER

MORILLO, JANELLE COMBS

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/620,388

Applicant(s)

IKUNO ET AL.

Examiner

Janelle Combs-Morillo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 7-14 and 20-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 15-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/28/04, 11/12/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of group I in the reply filed on May 25, 2005 is acknowledged. The traversal is on the ground(s) that the product cannot be made by a materially different method. This is not found persuasive because a process of casting a molten alloy *is* materially different from a process of forming by powder metallurgical process such as mechanical alloying, etc.

The requirement is still deemed proper and is therefore made FINAL.

2. Applicant's request to rejoin said groups, if the claims of group I are found allowable will be granted if said method claims contain each and every feature (or are dependent on) the allowable claims. See *In re Ochiai*, 71 F.3d 1565, 1572, 37 USPQ2d 1127, 1133 (Fed. Cir. 1995).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-6 and 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith (US 4,434,014) in view of "Aluminum Standards and data 2003" p 1-6 or "ASM Casting" p 743-760.

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Smith teaches a high strength and wear resistant aluminum alloy suitable for components in engines, including pistons (abstract). Said alloy comprises (in wt%): 12-15% Si, 1.5-5.5% Cu, 1-3% Ni, preferably 0.1-0.5% Fe, 0.01-0.1% Ti, 0.1-1% Mg, 0.01-0.1% Zr, 0.1-0.8% Mn, which overlaps or touches the boundary of the presently claimed ranges of Si, Cu, Ni, Fe, Ti, Mg, Zr, and Mn (cl. 1-3, 15-17). Smith teaches 0.001-0.1% of a modifier is present, but does not specify P (cl. 1, 15) or Ca (cl. 4, 18).

However, "Aluminum Standards and data 2003" p 1-6 teaches Na, Sr, Ca, and/or P are added to 3xx and 4xx type Al-Si foundry alloys in order to modify the structure. "Aluminum Standards and data 2003" teaches 0.005-0.15% Ca and $\leq 0.060\%$ P are effective modifiers. It would have been obvious to one of ordinary skill in the art to use Ca and P as modifiers for the Al-Si alloy taught by Smith, because Smith teaches that 0.001-0.1% of a modifier is present (Smith at cl. 1), and "Aluminum Standards and data 2003" teaches 0.005-0.15% Ca and $\leq 0.060\%$ P are effective modifiers for 3xx series Al-Si alloys.

Alternatively, "ASM Casting" teaches that Ca (p 745, 752) and 0.0015-0.03%P (p 746, 753) are added to Al-Si alloys in order to refine/modify the Al-Si eutectic. "ASM Casting" does not mention the range of Ca preferred, but teaches a very low amount of modifier is needed to be effective, for instance, $\leq 0.05\%$ (p 752). It would have been obvious to one of ordinary skill in the art to use Ca and P to modify the Al-Si alloy taught by Smith, because Smith teaches that 0.001-0.1% of a modifier is present, and because "ASM Casting" teaches that Ca and P are effective modifiers for Al-Si alloys.

Overlapping ranges have been held to be a prima facie case of obviousness, see MPEP § 2144.05. It would have been obvious to one of ordinary skill in the art to select any portion of the

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range, including the claimed range, from the broader range disclosed in the prior art, because the prior art finds that said composition in the entire disclosed range has a suitable utility.

Concerning claims 5 and 15, which mention the “pre-use” Vickers hardness, Smith teaches said alloy has excellent strength and hardness (see BHN, Brinell Hardness, Table 3). The examiner consulted a variety of handbooks and metallurgy texts, but was unable to locate a conversion scale from BHN to Vickers hardness. However, where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). Because the prior art teaches a substantially overlapping alloy composition, wherein said alloy is processed in a similar method of casting and heat treating (see examples of Smith), the properties applicant discloses and/or claims (such as Vickers hardness) are expected to be present. See MPEP 2112.01.

Concerning claims 6 and 19, which mention “wherein size of non-metal inclusion existing within the piston is less than 100 μm ”, because the alloy taught by Smith substantially overlaps the presently claimed alloy composition (as well as being processed by a similar method of casting and heat treating), then substantially the same non-metal inclusions are expected to be present (see discussion above). Additionally, the examiner points out that said claims are not drawn to *all* inclusions, or *an average*, etc., but said limitation is met by one non-metal inclusion being $\leq 100 \mu\text{m}$.

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Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janelle Combs-Morillo whose telephone number is (571) 272-1240. The examiner can normally be reached on 8:30 am- 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ROY KING 
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

JCM 
August 4, 2005